F.S. R-4
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TIMBER MANAGEMENT

Action		Initial
	Mongrief	
	Frykman	
	Gartenbach	
	Coonrod	
	Moran	
	Lowe	
	Hantzsa	
	Melvin	
	Payne	
	TM Clerk	

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Control
Sawtooth
✓ Insect

MOUNTAIN PINE BEETLE

CONTROL PROJECT

1958

Get a bit further than technical guidelines

Technical Guidelines for Sawtooth National Forest

By

Walter E. Cole
Entomologist

Prepared by

Division of Forest Insect Research
Boise Research Center
Boise, Idaho

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Technical Guidelines for
Sawtooth National Forest

by

Walter E. Cole[1/]
Entomologist

INTRODUCTION

The mountain pine beetle, Dendroctonus monticolae (Hopk.), has been building up in lodgepole pine throughout Region 4 for several years. The greatest concentration of infested trees lies within the Ashley and Wasatch National Forests in Utah. Smaller epidemic areas have been reported on the Teton National Forest, Grand Teton National Park and on some private land adjacent to the Targhee National Forest.

For the past few years beetle activity has been observed within drainages of the Big and Little Smoky Creeks and some maintenance control has been done. An appraisal survey within these drainages during the fall of 1957, showed a buildup ratio of infested trees of almost 4:1.

PROGRAM

Control effort should be directed primarily toward two areas. The Little Smoky Creek area, including spots on Warswich, Grindstone and Carrie Creeks, and the Big Smoky area encompassing the mouths of Miller, Bounds, Salt and along Paradise Creeks. Actually these areas should be worked simultaneously and if time allows, inspection for control purposes should be done along the South Fork of the Boise River.

Treatment of the infested trees can be accomplished by the application of ethylene dibromide (EDB), water and oil emulsion, or orthodichlorobenzine in fuel oil.

1/ The author acknowledges the valuable assistance and experience given him by R. I. Washburn, Entomologist, IF&RES, Ogden, Utah.

Methods and Procedures

Timing

Treatment of the infested trees can start any time after the area opens up. However, starting while the weather is still cold may cause some difficulties in mixing the insecticidal components--particularly if EDB is used. The EDB will have to be heated to dissolve crystals that form whenever the temperature of the solution drops below 48° F. (the lower the temperature--the harder to dissolve). Treatment can continue until beetle flight, which will probably occur around July 15. However, for insurance of good results, effort should be made to finish at least 2 weeks before beetle flight. Spraying while the brood is in the adult stage usually does not produce satisfactory results.

String Laying

To insure insofar as possible that all infested trees are located and treated, the control areas should be subdivided into parallel sections marked by lines of string. The parallel string lines should be run up and down the slopes (cross contour) and spaced 3 to 5 chains apart. String lines should be numbered and laid in advance of the spotting operation, and a tag giving the string number attached to the string at the start and end of the line and wherever the line intersects roads or trails.

Spotting

It is suggested that separate crews be organized to located (spot) the infested trees in advance of the treaters. A 4-man crew is usually used to cover strips 4 to 5 chains in width. The number of men per crew may be altered if a different number is determined to be more efficient for this particular situation. The spotters spread out and work between the string lines, always keeping abreast of each other and examining all lodgepole pine to determine which are infested. As they are located, the infested trees are blazed and a numbered tag attached. In addition a tag giving the location of the infested tree or trees is attached to the even numbered string (example of tag on string: 2 trees 3 chains west). Care should be taken to place these instruction tags on only the even numbered string lines.

Treating

The treating crews, usually 3 to 4 men in size, will work two string lanes at a time. The crewleader will follow the even numbered string line, retrieving the instruction tags left by the spotters and with help from the crew search out the blazed and tagged trees on each side of the even string line. These tags will be collected and turned in each night to insure that all trees were treated. Occasionally infested trees will be missed by the

spotters. If the treating crews find such, they are to treat these and record them as additional trees. An accurate record of the number of infested trees treated is an important project statistic.

Once the tree has been spotted and the tag removed, the treating crew will spray the tree by starting at the top and working down. The insecticide should be applied in sufficient quantities to cause it to flow or run down the tree. If the tree cannot be sprayed to a 4" diameter while standing it should be felled and the untreated portion sprayed. Thoroughness in spraying is absolutely essential. If horses are used to transport the insecticide they should be protected from the spray mixture by placing liquid repellent covers between the pack saddle and the jeep cans containing the insecticide.

Manpower Requirements

Based on other bark beetle projects similar in nature, it is estimated that approximately 400 man-days will be required to locate and treat the estimated 2,000 infested trees. Usually it requires about half of the man-days to locate (spot) the infested trees. In addition to the spotting and treating crew, an insecticide mixer, string layer, and transportation personnel plus the required overhead will be needed for the duration of the project.

Technical Assistance

The Division of Forest Insect Research will furnish the following services: (1) the training of personnel, including safety of handling of insecticides, (2) testing of insecticidal mixtures, (3) guidance on techniques and methods, and (4) determination of entomological effectiveness of the project.

Records

All pertinent information concerning the operation, administration, and results of the project should be accurately and reliably recorded. Such records are highly valuable to the immediate project and for any future control efforts.

Equipment and Supplies

Axes, hand with sheaths (Tomahawk preferred)		1 per man
Pumps, stirrup, giant "Smith bucket" (without hose or nozzle)		2 per crew
Hose, 3/8", 2 brain neophrene	minimum of	30 per pump
Fins, nozzle, Colo. fan spray type		2 per treating crew
Nozzles, No. 6, solid stream		2 " "
Rods, spray, telescopic type		2 " "
Rods, spray, 4 ft. curved		2 " "
Connectors, "Quick on" Truflate		
#101 female coupling 1/4"		2 " "
#112 male end 1/4"		2 " "
#312 male hose stems, 3/8" with pipe thread 1/4"		2 " "
Wrenches, crescent, 6"		1 " "
Graphite, string pump packing	(approximately)	25 ft. total
Cans, Jeep (screw caps)		30 per treating crew
Cans, oil measuring, (1 gal. cap.)		1 " "
Rags, clean		1 bundle total
String, butcher, about 3 miles to ball		2 doz. cones
Saw, power		1 per treating crew

Mixing plant

Insecticide

To make 10,000 gallons of finished insecticide required to treat approximately 2,000 trees when applied at the rate of 5 gallons per tree will require:

Orthodichlorobenzene, Tech. grade	220 gal. on hand
Fuel oil No. 1 or No. 2	1320 gal. needed

For EDB emulsion:

Ethylene dibromide, Tech. grade, 99%	5076 lbs. needed
Emulsifiers:	
Triton x 151 or equal	156 lbs. needed
Triton x 171	771 lbs. needed
Fuel oil No. 1 or No. 2	1297 gals. needed

Ethylene dibromide is highly corrosive to aluminum, magnesium or alloys of these metals; therefore, only fittings, flow meters, and nozzles made of copper, yellow brass, 18-8 stainless steel, silicon bronze or tin bronze should be used.

Mixing and Application of Insecticide

The standard 380 mixture ethylene dibromide should be used. Formula is as follows:

Stock solution (EDB emulsifiable concentrate)	
EDB (ethylene dibromide) tech. grade	3. lbs.
Emulsifier	
Triton x 151	.0833 "
Triton x 171	.4167 "
Fuel oil to make	1. gal.

To make finished emulsion disperse 1 volume of stock solution into 4 volumes of water.

A workable formula for field use is:

EDB (90 lbs.)	1 Jeep can (5 gals.)
Triton x 151 (2.7 lbs.)	about 0.33 gal.
Triton x 171 (13.7 lbs.)	about 1.67 gal.
(a suitable volume measure can be made from a one-gallon oil measure).	
Fuel oil	23 gals.

It is suggested that the mixing be done in 50-gallon drums that have had the bottoms removed. A suitable elbow of pipe and spigot should be threaded into the 3/4" spigot opening. The drums should be placed open side up on planks to protect the spigot. A mark is made on the inside of the drum at the 30-gallon level.

To mix field formula concentrate add roughly 1/2 the fuel oil, pour to EDB and emulsifiers, fill to 30 gal. level with fuel oil. Stir the solution with a shovel and drain off in 1 gallon lots. Pour 1 gallon of the concentrate into each Jeep can. The 4 gallons of water should be added to each Jeep can shortly before the spray is to be applied. The mixture should be shaken to insure the formation of a good emulsion. The resultant emulsion should have a rich milky white creamy appearance. Finished emulsion should be used within a 48-hour period after addition of the water.

The finished emulsion should be applied to the infested boles in sufficient quantities to cause the emulsion to run. Care should be exercised to make certain that the under sides and hard to get at places of the down trees are thoroughly wetted.

Hazards Involved in the Use of Ethylene Dibromide or Orthodichlorobenzene

Ethylene dibromide in the concentrated form is extremely harmful to warm blooded animals. Men can be seriously affected by inhalation of the vapors, and their bodily contact with the liquid. Reasonable care will avoid these dangers.

In order to reduce the hazards to a minimum, a carefully chosen man, and trained assistants if necessary, who fully understands the hazards should be selected to mix or otherwise handle the EDB concentrate.

No one else should be allowed to come in contact with the tech. grade EDB or with the stock concentrate.

All mixing should be done outside.

A supply of rags and clean water should be on hand at mixing stations at all times.

No protective clothes are required.

Mixer must wash off spillage with clean water.

Any clothing that becomes contaminated should be removed and washed or aired.

Properly handled EDB is not dangerous but improperly handled it produces serious burns, sickness and even death.

The finished EDB emulsion as applied to the trees is relatively harmless. However, if confined for extended periods in the clothing it will cause some burning and irritation. To protect the treater:

A supply of clean rags and water should be carried by each crew.

Treaters should be instructed to avoid repeated exposure to spray drift and leakage.

All emulsions that reach the skin should be washed off immediately.

Treaters should have their clothing washed at least once a week--if an unusual amount is spilled on the clothing they should be removed immediately and washed.

IN GENERAL, WHENEVER HANDLING TOXIC CHEMICALS, IT IS GOOD BUSINESS TO BE OVERLY CAUTIOUS RATHER THAN TAKE A CHANCE.